

Digital Recording For Bards

This is an article that I wrote for my personal blog. It was published in four separate parts. The following prelude began each part:

I want every bard and musician in the Knowne World to be able to record their works and spread them as far and wide as possible. The tools to do that need to be easy, they need to be inexpensive, and they need to be digital. Tape recorders are fine for practicing or composing with, but they do not have the quality or the ease of distribution that digital files provide.

Anybody can set up a reasonable digital recording studio and record their own work and/or be a central source for others in their local groups.

Part 1

This is the **first article** in a series on digital recording for bards, and in it I will cover the **computer hardware**.

You can record with any computer. However, the results may well be disappointing if the machine is underpowered or improperly equipped. After a few years experience, and some current research, here is what I have found to be minimum.

- 1) A recent, Pentium-class machine. Mine is ancient, a PIII-400Mhz. It is more than sufficient for recording but any kind of effects processing is excruciatingly slow. If your computer is less than this, you will need a new one.
- 2) A 7200rpm hard drive that is strictly for recording. It should be used for nothing else, all your programs should reside on your main hard drive. The recording drive should be as large as you can afford. 80gb 7200rpm hard drives can be purchased [for less than \\$80](#). If your computer is capable of using SATA drives, [160gb to 200gb drives go for less than \\$100](#).
- 3) The best sound card, bar none, for our purposes is the [SoundBlaster Live! 24-bit internal](#). It is under \$45. All other consumer sound cards, including all of the other SoundBlaster cards, are poor choices for recording, or are just as good as the SB Live! but cost far more. The [SB Live! external](#) has latency issues that make it a poor choice for recording. There are much better audio interfaces, but they start at \$350 and go up rapidly from there.
- 4) [512mb or more of RAM](#) (memory).

5) A CD-R/RW drive, [\\$40 or less](#). These should come with software, look for Nero Burning ROM if you have a choice.

As you can see, a recent computer will have most of these characteristics. All but the CD-R drive have one purpose; to reduce or eliminate latency. I will discuss latency in a later article, but it can make recording difficult to impossible.

In Part 2 I will talk about **software**.

Part 2

This is the **second article** in a series of articles on digital recording for bards, and in it I will cover **software**.

Operating System (OS)

If you are using an existing computer for your DAW (Digital Audio Workstation), and your operating system is at least [Windows 2000](#), then you won't need to worry about this. If you are building a computer for this purpose, or upgrading, I recommend [Windows XP Home](#). You don't need the features of [Windows XP Professional](#), or the extra cost.

While [Linux](#) is rapidly catching up to Windows (with programs like [Rosegarden](#), [Ardour](#), and [Audacity](#)), and options such as [Studio to Go!](#) are generating a lot of interest, and there are some very good solutions available for [Macintosh](#), none of them are at the same time simple to use, easy to set up, and inexpensive. I am a Linux aficionado so I would dearly love to be able to say otherwise. As soon as I can test, say, Rosegarden on [Ubuntu](#) and have it do everything flawlessly I will be the first to let you know.

Recording/Editing Software

This is easy...[Audacity](#)

It runs on Windows, Mac, and Linux. It has all the tools you are likely to need for recording, editing, and enhancing with effects. It is fast and efficient. It is easy to learn. And it is free...both as in "free speech" and as in "free beer".

If you are feeling adventurous, there are many good commercial programs. I use [Powertracks](#), [Cubase](#) is another good alternative. The website [Hitsquad](#) catalogs sound programs, free and commercial, along with user comments so this is a good place to go hunting if you want to look for other products/capabilities.

CD Burning/Mastering Software

For CD burning, [Nero](#). If your CD-R drive did not come with it, buy a copy to replace whatever it did come with.

Mastering is simply making all your tracks sound like they belong together on the same CD. 99.99% of the time this consists entirely of normalizing, or making all tracks the same loudness. (Some of the early copies of The CD had this problem, one track was much quieter than all the others)

For basic normalization I use a free program called [Audiograbber](#). This program is primarily for ripping CDs, that is, copying them to your hard drive so that you can download to an iPod, make personal mix CDs, or just listen to the songs on the computer. But it includes a very good normalization tool that allows you to normalize an entire group of tracks in one pass. You may still have to adjust one or two by ear, but if you have an entire directory of tracks then Audiograbber will get them all close enough that the manual process is quick and painless.

In Part 3 I will discuss **recording equipment**.

Part 3

This is the **third article** in a series of articles on digital recording for bards, and in it I will cover **recording equipment**.

Microphones

For voice recording you will want a large diaphragm, cardioid-pattern, condenser microphone. These will be familiar to anyone who has been in, or even seen pictures of, a professional recording studio. These mics used to run thousands of dollars apiece. Some still do. Fortunately, there are very fine studio mics available at much more reasonable prices, down around \$100. They include:

- [Studio Projects B1](#)
- [Audio-Technica AT2020](#)
- [Marshall Electronics MXL V67G](#)
- [AKG Perception 100](#)

Other products by these manufacturers are also available for slightly higher prices; for example the AKG Perception 200 comes with a switchable bass rolloff, -10db pad, a shockmount and a nice padded aluminum case for about \$160...but you don't need those bells and whistles for basic recording, and you don't need a shockmount if you aren't stomping on the floor while you record. Condenser mics are very sensitive to being banged around, though, so storing them in a padded, dust-free container when not in use is a good idea. A plastic bag and bubble wrap in a shoe box should work just fine. You will need a pop filter to place in front of the microphone. These are a bit pricey, but a nylon stocking stretched over a hoop made of an old clothes hanger will work fine.

Pre-amps

You will need a pre-amp. This amplifies the signal from the microphone and provides “phantom power” to the microphone itself. The best bang for the buck for our purposes is the [M-AUDIO Audio Buddy](#), although the [ART Tube MP](#) is also a very good product. A small mixer with built-in pre-amps is more expensive, but may be more comfortable for some people.

Just a note at this point; there are digital audio interface units designed to connect directly between your computer and microphone. They replace both the sound card and the pre-amp. They connect to your computer either through a USB or a Firewire connection. The USB units are more expensive than the sound card/pre-amp option and still have latency issues when multitracking. The Firewire units are much better performers, but are more expensive yet.

When these products reach a better price/performance point they should be strongly considered; the fewer changes between analog and digital in the recording process, the better and easier it becomes.

Headphones and Speakers

You need at least one set of studio headphones and monitor speakers. If more than one person will be involved with the recording process, you will want additional sets of headphones.

Studio headphones and monitor speakers provide “flat” sound so that you hear the recording as close to pure as possible. This is important when you are multitrack recording and trying to match up with pre-recorded voices or instruments. It is also important when you are adding effects to the final mix.

You can, again, spend many thousands of dollars on these products. I have found, for our purposes, a couple of options with a much better price/performance ratio for our needs. They are the [Sony MDR-7502](#) headphones and the [Behringer MS16](#) monitor speakers. The Behringer speakers are identical to the discontinued Roland MA-8 speakers which you may be able to find used.

Cables

In this kind of studio, while we have kept cabling to a minimum, there are still lots of cables to deal with. Think about cable routing issues as you are planning.

I can say from experience that cables are no place to skimp. Your choices of equipment will dictate what kind of cables you require, but at least one [XLR microphone cable](#) of appropriate length will certainly be necessary. Also a [Y-cable](#) (dual 1/4" male to 1/8" stereo male) between your sound card and pre-amp.

By the way, Sound Professionals is the best online source I have found for cables. They also have various digital recording equipment for studio and field recording.

That about does it for recording equipment. The next, and last, article in this series will cover some **concepts, sources, and alternatives**

Part 4

This is the fourth and final article in a series of articles on digital recording for bards, and in it I will cover **concepts, sources, and alternatives**.

Concepts

There are some basic concepts in recording that you need to have some understanding of.

Latency - this is the time between the sound being made and the same sound being recorded or re-played. Latency in recording occurs because the system cannot process the signal fast enough to record it all. This results in dropouts in the final recording.

Latency can also appear when you are trying to add a track (multi-tracking). This is because the system is not fast enough to both play back the earlier recording and record the current signal. This can cause you to hear an "echo" as you try to record; very disconcerting.

You eliminate latency by having the fastest equipment you can afford, and by reducing the other tasks your equipment is trying to perform. Do not run any other programs while recording or editing, including any background programs or programs in the system tray that you can close down.

Wet/Dry/Flat/Color/Warmth - When you are doing a proper studio recording, you usually want the recording to be "dry", and you want to hear it through headphones and speakers that are "flat". That is, no artifacts or effects produced by the recording environment or the equipment. Which means when you play back your recording at first you may think it sounds terrible; flat, dull, lifeless. You make it "wet" by adding effects, such as reverb, when editing.

As you learn your way around, you will begin to add "warmth" and "color" as you record; recording in a special room, or with a mic that modifies the sounds it picks up in certain ways, or something similar.

Alternatives

You have probably looked at the list of equipment and software that I have provided and said "but Mathurin, I thought you said this was going to be inexpensive!" Well, inexpensive is a relative term. A couple of thousand dollars to get good, clean sound recordings is quite inexpensive.

You can prioritize your purchases and spread them out. Start with Sound Recorder or Audacity, a cheap computer mic, and consumer headphones, and add bits as you can afford them. Recognize that you are trading off sound quality to do this and don't get discouraged.

Finally, you can buy specialized digital recording equipment that allows you to transfer your recordings to computer via USB or Firewire connection. This has in the past been even more expensive, but newer removable media devices are changing that.

Multi-track recorders

Portable recorders:

[Edirol R09](#)

[M-Audio MicroTrack](#)

[Marantz PMD660](#)

Sources

Audio & recording equipment:

[Zzounds](#)

[Musician's Friend](#)

Portable recording, cables:

[The Sound Professionals](#)

Software:

[Audacity](#)

[PowerTracks Pro Audio](#)

[Ableton/Pro-Tools/Session](#)

[Pyro, SONAR, Music Creator](#)

[Cubase, Studio Case](#)

[Nero](#)

Websites:

[Homerecording.com](#)

[Computer Based Home Studio Recording for Musicians](#)

[Tweak's Guide](#)

Books:

[Digital Home Recording - Tips, Techniques, and Tools for Home Studio Production](#)